

CLIMATOLOGICAL DATA FOR FEBRUARY, 1911.

DISTRICT No. 8, TEXAS AND THE RIO GRANDE VALLEY.

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GENERAL SUMMARY.

The month of February was characterized by generally warm weather and by heavy precipitation in the greater portion of the district. The amount of sunshine was deficient, especially in west Texas, New Mexico, and Colorado. The most noteworthy features of the month were an abundance of moisture in Colorado, New Mexico, and the northern and western portions of Texas, which relieved the drought in those sections, and a severe cold spell from the 19th to the 24th, which caused considerable damage in the southeastern portion of the district, especially as the warm weather of the preceding weeks had stimulated vegetable growth to an unusual extent. A general deficiency of precipitation occurred over a large area of Texas bordering on the Gulf of Mexico and extending inland on the western margin from Nueces to Lampasas County, and on the eastern margin from Jefferson to Panola County. The shortage was greatest in the southeastern portion of this area, where the monthly amounts of moisture were less than in the semiarid regions of the west. There was very little precipitation prior to the 8th in Texas, and prior to the 12th in Colorado and New Mexico. After those dates it occurred at frequent intervals until the close of the month. The average number of days with 0.01 inch or more of precipitation was 11 in Colorado, 7 in New Mexico, and 6 in Texas.

The greatest and least monthly amounts in Colorado were 5.98 inches at Cumbres and 0.50 inch at Garnett; in New Mexico, 4.53 inches at Aspen Grove Ranch and 0.74 inch at Ancho; and in Texas, 6.13 inches at Longview and 0.04 inch at Liberty. Excessive amounts of 2.50 inches or more in 24 consecutive hours occurred as follows: Claytonville, 2.73; Flatonia, 3.13; Jayton, 2.50; Lagrange, 2.83; Longview, 2.60; Plainview, 3.50; Robert Lee, 3.35; Somerville, 2.80; and Thurber, 2.61 inches.

The snowfall was heavy over the upper reaches of the Rio Grande and Rio Pecos watersheds, and very light in southern New Mexico and in Texas. The greatest monthly fall in Colorado was 64.5 inches, at Platoro, and in New Mexico, 63 inches, at Red River Canyon.

TEMPERATURE.

The monthly mean temperature averaged 2.7° above the normal in Colorado, 0.4° above in New Mexico, and 5.2° above in Texas. The excess covered the entire district, except portions of the Rio Grande Valley from Santa Fe to El Paso, where it was slightly colder than normal. The month opened unusually warm, and warm weather continued with but little interruption during the greater part of the first and second decades. In a large number of local-

ities the highest temperatures of the month were recorded on the 1st. A period of unusually cold weather set in on the 19th, which lasted until the 24th, when there was a change to warmer, although in the northern portion of the district low night temperatures continued to the close of the month. During this cold spell temperatures below freezing occurred nearly to the Gulf coast, and temperatures below zero occurred in Colorado and portions of New Mexico. The average diurnal range of temperature varied from about 9° on the upper Texas coast to about 31° in the extreme northern portion of the district.

The highest and lowest temperatures reported were: In Colorado, 62° at Saguache on the 2d and -20° at Manassa on the 23d; in New Mexico, 87° at Carlsbad on the 1st and -16° at Red River Canyon on the 22d; and in Texas, 97° at Graham on the 1st and at San Marcos on the 5th, and 12° at Plainview on the 22d. The local monthly means ranged from 18.6° to 30.5° in Colorado, from 25.4° to 49.8° in New Mexico, and from 42.2° to 69.4° in Texas.

PRECIPITATION.

The precipitation over the Rio Grande watershed averaged 2.09 inches, which is nearly 1 inch greater than normal, and over twice the amount reported for January. The excess covered practically the entire stretch from north to south. The greatest precipitation was 5.98 inches at Cumbres, Colo., and the least 0.50 inch at Garnett, Colo.

The Rio Pecos watershed also had a decided excess of precipitation. The average for the entire drainage area was 1.98 inch, which is about 1.30 inch greater than normal and over four times the amount reported for the preceding month. The greatest precipitation was 3.94 inches, at Windsors Ranch, N. Mex., and the least, 0.85 inch, at Liston, N. Mex. Nearly all the precipitation over the upper portions of both the Rio Pecos and Rio Grande watersheds was in the form of snow.

There was a marked increase in the precipitation over the Texas watersheds from that reported for the preceding month. The total average was about six times greater. In general the monthly amounts over the upper stretches of the watersheds were decidedly in excess of the normal, but the amounts over the lower portions and over the coastal plains were deficient. The greatest monthly precipitation was 6.13 inches, at Longview in the Sabine Valley, and the least 0.04 inch, at Liberty in the lower Trinity Valley. The following are the average monthly amounts in inches for the various watersheds: Nueces, 1.73; San Antonio, 2.07; Guadalupe, 2.41; Lavaca, 2.02; Colorado, 3.08; Brazos, 2.82; Trinity, 3.38; Neches, 2.88;

Sabine, 3.58; and coastal plains, 1.09. In January the averages varied from a minimum of 0.23 inch for the lower Guadalupe to a maximum of 0.71 inch for the Neches.

RIVER CONDITIONS.

The streams of the district generally averaged higher than during the preceding month, but there was very little change until after the middle of the month. On the 18th sharp rises occurred in the upper Colorado, and on the 21st in the upper Brazos and upper Trinity. The Colorado rise was felt throughout its length, and the stages reached, although below flood stage, are the highest on record for February. The Trinity and Brazos rises did not show up much in the lower portions of these streams. The Brazos, however, rose higher in its upper and middle portions than in any previous February since 1903.

SNOWFALL IN THE MOUNTAINS.

There was much snowfall during the month, and the prospects for irrigation water are decidedly more favorable than at any previous time this season. The accumulated depth of snow over the headwaters of the Rio Grande and Rio Pecos at the close of the month was greater in many localities than during the corresponding period of the previous year. The following extracts from reports of Weather Bureau officials furnish special information on the snowfall conditions in these drainage basins:

Colorado.—The latter half of February was stormy, and valuable additions to the stock of snow in the mountains were made on all watersheds, notably on the Rio Grande. A considerable excess was general in the Rio Grande drainage basin and over the adjacent small watersheds. As a whole, the snow is solidly packed on the western slope and loosely packed on the eastern slope.

Comparing the depths on the ground at the end of the month, the average for the snow scales on the Rio Grande, 30 inches, is 5 inches more than a year ago. For the early part of the irrigation season, about the normal flow is indicated.—*F. H. Brandenburg, district forecaster.*

New Mexico.—Very general and heavy snowfall occurred over the Rio Grande watershed during the last half of February, and a large amount of accumulated snow is reported over the headwaters of this stream, and thence southward to central New Mexico, while the southern districts generally had heavy rain. An excess in precipitation also occurred in January, with small run-off, so that the soil is well filled with moisture and the water outlook is greatly improved. Early water will be abundant and the prospect is promising.

General and fairly heavy snow occurred over the mountain districts in the Rio Pecos watershed, and over the plateau and some of the plains country, while good rains were general over the lower levels and the southern latitudes. The soil is now well filled with moisture and the outlook greatly improved. The main stream and some of the tributaries will have a good early flow, but seasonal rains will be needed to continue it far into the irrigation season.—*C. E. Linney, section director.*

MISCELLANEOUS.

Alvin.—Every new shoot was killed by the frost of the 22d and 23d.

Big Springs.—Farmers say they have the finest season, for this time of the year, they ever have had.

Bowie.—The cold wave of the 19th to 24th killed nearly all fruit which was in blossom.

Cameron.—The cold spell of the 23d and 24th killed part of the vegetable crop and about 20 per cent of the fruit.

Cuero.—The cold wave of the 23d and 24th killed some vegetables and some of the young corn that was up.

Gorham.—The top soil is in fine condition for the planting of crops, but the moisture is very shallow and a great deal more rain is needed.

Grand Saline.—Most of the fruit was killed by the severe freeze of the 19th and 20th.

Hondo.—The severe weather of the 23d and 24th did great damage to fruit, figs, etc.

Lagrange.—The killing frost of the 21st to 24th did considerable damage to blooming fruit trees.

Ricardo.—The cold snap, commencing as it did after unusually mild and growing weather, was very damaging to cucumbers, okra, squash, melons, and other early tender vegetables.

BRAZOS RIVER OVERFLOWS AND LEVEE PROTECTION.

By W. W. DIBRELL, Levee Engineer, U. S. G. S.

The recent awakening of the landowners of the Brazos bottoms to the fact that large areas of this land can be protected at a small expense by the construction of levees has attracted public attention to a certain extent, but as yet the general public has no accurate idea of the immense value of the agricultural lands of the Brazos nor the great losses entailed by the overflow of the river.

The Brazos River proper heads in the Staked Plains of western Texas, in Hale and Lamb Counties, flows in a southeasterly direction, and empties into the Gulf of Mexico, draining an area of over 50,000 square miles. The stream in its entire length flows through a soft material, ranging from a black calcareous alluvial soil at the upper end to a sandy and clay loam representing reworked material in the lower parts. At the least sign of high water the river becomes a murky red and carries a large amount of silt. Although draining a very large territory, the river sometimes becomes very low, and the writer has waded it many a time during the dry season. Its main tributaries, the Little River and Little Brazos, have the same characteristics as the main stream and, though draining a smaller area than the main river, do great damage in times of overflow.

The overflows of the Brazos and results therefrom form an interesting study, but, unfortunately, until late years no accurate record has been kept of them. The first inundation of which even tradition speaks occurred in 1833, the next in 1843, and then one, of which there is more known, in 1852. This last appears to have covered immense areas of land and to have done great damage to stock, but facts are meager and unreliable, as might be expected, coming mostly in verbal form from old settlers. Between this flood and the next over 30 years elapsed, in which there was practically no high water, and the natives became careless and overconfident, so that the overflow of 1885 took them entirely by surprise. It seems as if the most damage in this case was done in the upper section, but no reliable reports can be obtained. The land in the lower section had not been cleared to any great extent up to this time, and therefore the damage was not as great as it might have been under other conditions.

What appears to have been the greatest and most general overflow of the Brazos, however, occurred in June and July, 1899. The year "99" is spoken of with awe by the natives and will long be remembered by them. Several years directly preceding 1899 were characterized by dry weather, and until June of that year the rainfall was barely normal. About May 20 excessive rainfall began to be reported all over the Brazos basin. At Anson, Jones County, the precipitation for June was 6.3 inches, against a 12-year average of about 2.4 inches. At Abilene, Taylor County, it was 5.45, average 3;

